1553 Test Page

Diagnostic application

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Introduction

This application is used for diagnostic testing of 1553 hardware attached to a Local Station. Sequences of 1553 commands including output data can be composed and run multiple times at 15 Hz to increase the usage rate. Errors are detected and counted, retaining the last error status word. The 1553 hardware driven by this program must be attached to the local station. (To initiate testing remotely, one could use the "Page G" facility that allows running a station's application from another station's console.)

Display layout

```
0     9 1553 TEST PAGE  10/13/89 1430
1     *NOW      450 ADDR=200000 #=  10
2      RT T SA #W DATA  CMD STAT ERRC
3     * 2 1 18  1 5555 1641 1000 0000     1553 commands
4     * 2 1 19  1 AAAA 1661 1000 0000     (up to 10 lines)
…
```

This example shows reading the two digital input words from a rack monitor selected as RT#2 accessed via controller #0, after running for 3 seconds.

Display areas

Enter the 1553 controller base address on line 1. Each 1553 controller board includes two 1553 controllers, and each controller occupies 64K bytes of memory space. The most significant 7 bits of the board's base address are set via switches on the controller board.

Enter a multiplier count at the right end of line 1 to specify the number of times per 15 Hz cycle that the sequence of 1553 commands specified on the page is to executed. Using a value larger than 1 gives bright scope traces and can generate better error statistics.

Starting with line 3 is a list of up to ten 1553 commands. The first column is a flag character (blank=inactive, period=one-shot, star=continuous). The 4 components of the command word are shown in the next 4 fields of each line. The first data word is shown next, followed by the encoded command word, the status word returned from the RT, and the error counter. The error counter field can be changed to the controller's error status word by interrupting under the ERRC word on line 2 to change it to ERRS. (Interrupt again to change it back.) The data word only gives the first word of data associated with the 1553 command transfer. To access the other data words, either use the raise/lower buttons, or enter a "group#" in the range 0-8 after the word DATA on line 2. Group 0 is displayed as above. Group 1 displays the first 4 data words (starting with the first word that was shown in group 0), group 2 displays the next 4 words, etc.

Entering 1553 commands

Specify each command by entering decimal values for the remote terminal (RT), the transmit/receive bit (1=Transmit), the subaddress (SA) and the word count (#W). An interrupt at the start of the line toggles through the flag sequence (space, period, star).

While entering changed values of the fields which make up the command or data, it is not necessary to interrupt, as all the displayed fields will be read when the RUN is activated the next time. While it is active, the commands cannot be altered by typing new values and interrupting; however, the flags can be toggled to enable / disable commands individually, and the data word values used for output can be altered.

Status bit display

There are 1553 standard conventions for the use of the bits in the status word received from an RT in response to a command sent by the controller. To display a status word shown in hex from the STAT column, whether the RUN is active or not, interrupt under the status word value. The display is then rewritten to show the bit-by-bit breakdown of the status word. The top 5 bits are the RT address and are shown as one value, whereas the other bits are each shown on a separate line. Interrupt anywhere on these 12 lines to return to the main display.

Similarly, there are specific meanings for the error word received from the controller. These can also be broken out by interrupting under the error status word (or error count). Another interrupt returns to the main display.

Retained parameters

Upon exit from the page, the base address, multiplier count, and all 1553 commands including the execution flags are saved for recall when the page is re-invoked. Only the first data word, however, is saved. When the page is next called up, the other 31 data words for each command will be set to zeros.

1553 data acquisition

This program uses a diagnostic routine called EXEC1553, included with the system software, to access the 1553 hardware. It executes one command at a time by setting up a 1553 command block at the base address plus $80. The Pascal declaration of this routine is as follows:

```
Procedure Exec1553(cmd: Integer;      {  1553 command word }
      adr: Longint;       {  controller base address }
      VAR data: Integer;  {  data array }
      VAR stat: Integer;  {  returned RT status }
      VAR errs: Integer); {  returned error status}
```